D. Cope and A. S. Packard, jun., on the fauna of Nickajack Cave. Many miles were explored, and no end reached. The invertebrate fauna of the caves proved very considerable, and several new species are described and figured; one of the most interesting is the blind crayfish (*Orconectes hamulatus*, Cope).—Recent Literature, Scientific News, &c.

Rivista Scientifico-Industriale, No 18, October 15.—Malfatti's fossil Italian insects.—On the rectification of the cycloid, by Prof. Dainelli.

Verhandlungen der k.k. geologischen Reichsanstalt, No. 14, September 30.—Inclosures of foreign stones in crystalline limestone, by T. Fuchs.—Picrite-porphyry of Steierdorf, by E. Hussak.—On tentaculites, by O. Novak.—A note on the diluvium of Masenderan in Persia, by E. Tietze.—Travellers' reports.

Journal of the Asiatic Society of Bengal, vol. l. part 2, No. 3, 1881 (October 22).—Geoffrey Nevill, on new or little-known mollusca of the Indo-Malayan fauna (plates 5 to 7).—Dr. O. Feistmantel, a sketch of the history of the fossils of the Indian Gondwána system.—Prof. V. Ball, additional note on the identification of the ancient diamond mines visited by Tavernier.—J. Wood-Mason and Lionel de Nicéville, list of diurnal Lepidoptera inhabiting the Nicobar Islands.

Revue des Sciences Naturelles, tome 1, série 3^e^, No. 1, September, 1881, contains:—P. Gazalis de Fondouce, on Tertiary man in Portugal.—Prof. S. Berggren, on the prothallus and on the embryo of Azolla (plate 1).—G. M. Viguier, studies on the formation of tufas of the present epoch.—Dr. P. Amans, anatomical and physiological researches on the larva of *Æschna grandis* (plate 2).—Account of the Zoological Station at Cette.

Revue internationale des Sciences biologiques, October, 1881, contains:—M. Bochefontaine, on the effects of the obstruction of the coronary arteries on the heart's action.—Jules Soury, on the modern doctrine of hylozoism (the doctrine which considers matter as living).—Prof. Hanstein, protoplasm considered as the basis of animal and vegetable life.—Dr. W. Roberts, on the digestive ferments.

THE last number of the *Journal* of the Russian Chemical and Physical Society contains, besides the minutes of proceedings, papers by Prof. Menshutkin, on the etherification of polybasic acids; on the bromides of vinyle, and on cholic acid, by M. Kutcheroff; on the affinities of sulphur with metals, and on the means of discovering cadmium in presence of copper, by M. Orlovsky; and on the potential of hydrostatic pressures, by M. Latchinoff.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 8.—"On the Coefficients of Contraction and Expansion by Heat of the Iodide of Silver AgI; the Iodide of Copper Cu_2I_2; and of five Alloys of these Iodides," by G. F. Rodwell, F.R.A.S., F.C.S., Science Master in Marlborough College.

The experiments herein described are a continuation of those relating to the anomalous expansion by heat of certain iodides, published at intervals during the last five years in the *Proceedings* of the Royal Society. New determinations of the coefficients of iodide of silver are given. Certain physical and chemical properties of cuprous iodide are detailed, and its coefficient of expansion is determined. Five compounds or alloys were prepared, and their physical characteristics examined. They possessed the following composition, and percentage of iodide of silver:—

Composition.	Percentage of Iodide of Silver.
$Cu_2I_2.AgI$	38·2233
$Cu_2I_2.2AgI$	55·3066
$Cu_2I_2.3AgI$	64·9884
$Cu_2I_2.4AgI$	71·2225
$Cu_2I_2.12AgI$	88·1304

They are compared with the five chlorobromiodides of silver previously examined by the author (*Proc.* Roy. Soc. vol. xxv. p. 303), and with the lead-silver iodide alloy last described (*Proc.* Roy. Soc. vol. xxxii. p. 540).

The following are some of the results observed in connection with the new copper-silver iodide alloys:—

"1. The specific gravity varies but slightly, viz. from 5·7302 to 5·6950, and is a little above the mean specific gravity of the constituents."

"2. The melting points are in all cases much lower than that of either iodide of silver or iodide of copper, for while the former is 527° C., and the latter 601° C., the highest melting-point of any one of the alloys is 514° C., and the lowest 493° C.

"3. Some of the alloys possess three points of similar density, and some two, at different temperatures. They are resinous in fracture, and transparent in thin layers. When pulverised they furnish brilliantly yellow powders, unaffected by light.

"4. When heated in a current of carbonic anhydride they volatilise very slowly. Heated in dry oxygen iodine is freely evolved, and oxide of copper appears on the surface of the mass. When heated in dry hydrogen hydriodic acid is produced, and the metal is reduced.

"5. The coefficients of expansion of the alloys below the point at which contraction on heating commences, was found to decrease as the percentage of iodide of silver was augmented.

"6. While the iodide of silver commences its considerable contraction at 142° C., the five chlorobromiodides of silver, the percentage of iodide of silver in which varies from 26·1692 to 73·9285, and the lead-silver iodide alloy, the percentage of iodide of silver in which amounts to 33·794, all commenced their contraction at 124° C., that is 18° C. lower, although the coefficients of expansion of the associated bodies necessarily differ. Thus it would appear that 124° C. is the temperature at which iodide of silver commences its passage from the crystalline into the amorphous condition when freed from the attraction of its own molecules, provided no other attraction or influence supervenes; while the attraction exerted when it exists unalloyed with any other substance, and when its molecules are hence much nearer to each other, raises the point at which the change commences to 142° C.

"7. When the same result was looked for in the case of the copper-silver iodide alloys, it was not found. In fact the presence of the iodide of copper, instead of promoting the assimilation of molecular motion and lowering the point at which the change from the crystalline into the plastic condition commences was found to considerably raise it; although the coefficient of expansion of the iodide of copper is lower than that of either chloride or bromide of silver or of the iodide of lead which enter into the composition of the other alloys. Thus:

Percentage of iodide of silver in the copper-silver iodide alloys.	Temperature at which contraction on heating commences.
38·2232	284° C.
55·3066	233°
64·9886	214°
71·2225	199°
88·1304	153°

Hence while 66·206 per cent. of iodide of lead lowered the point of change 18° C., the presence of 61·7767 per cent. of iodide of copper raised it 142° C."

A general discussion of the results is given and the special properties of the alloys described.

Linnean Society, December 15.—G. Busk, F.R.S., in the chair.—Prof. T. S. Cobbold exhibited a large guinea-worm (*Dracunculus*) taken from a pony, and forwarded by Vet. Surg. Frederick Smith from Madras. Only one previous instance of the occurrence of this parasite in the horse has been mentioned, and its authenticity was doubted by Fedschenko and other helminthologists.—Mr. G. S. Boulger brought before the meeting a set of large papier-maché models of insectivorous plants made at Breslau by Herr Brendel under the superintendence of Prof. Cohn. Mr. Boulger explained their adaptation for teaching purposes, and made special reference by a diagram to the various stages and physiological distinctions of these plants, viz. from simple viscidity of surface to the more complex apparatus in Dionæa and Aldrovanda.—Mr. T. Christy called attention to a volume of the Annual Report of the Commissioner of Agriculture, Washington, U.S. (1879), wherein was embodied much valuable information on the insects and parasites destructive to crops, &c.—Prof. Duncan thereafter gave the gist of a paper on the morphology of the test of the Temnopleuraidæ.—A paper by Dr. Maxwell Masters followed, dealing with a new species of cotton (*Gossypium Kirkii*) from East Tropical Africa. It has an interest historically from being probably the origin of very numerous cultivated varieties. It was obtained by Sir John Kirk growing wild at Dar Salam. Dr. Masters regards it as most nearly allied to *G. barbadense*, which is most

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commonly cultivated in tropical Africa; though along the Nile valley *G. herbaceum* is that usually in cultivation. According to authorities, cotton was not cultivated in Egypt in ancient times, and the fact that the varieties now grown there are for the most part forms of *G. herbaceum*, suggests the idea that India is the source whence Egypt has derived the cotton—a notion confirmed by various other considerations. The wild form of *G. herbaceum*, Dr. Masters has previously shown, is probably *G. Stocksii*, Masters, a native of Scinde.—A note on *Abies Pattonii*, Jeffrey, MS. 1851, by Prof. W. R. McNab, was then read. The author mentions that the trees known as *A. Hookeriana* and *A. Pattonii* have been a source of confusion to botanists and horticulturists. Andrew Murray, in 1855, in describing a New North American pine, mixed up the leaf of *A. Pattonii*, Balf., from Mount Baker, with the cone of *A. Hookeriana* from Scots Mountain, Oregon, originally collected by Mr. John Jeffrey. Dr. McNab, in unravelling the error, proposes that as Jeffreys, No. 430, from the Cascade Mountains, named by Balfour *A. Pattonii*, in the Oregon Circular, was unpublished, it should now be referred to *Tsuga Hookeriana*, and the Mount Baker tree he regarded as *T. Pattoniana*.—There followed a paper by Dr. G. E. Dobson, on the digastric muscle, its modifications and functions; and thereafter the eleventh part of the Mollusca of the *Challenger* Expedition, by the Rev. R. Boog Watson, was read in abstract.—Messrs. W. H. Coffin, E. Milner, and S. H. Parkes were balloted for and elected Fellows of the Society.

Mineralogical Society, December 14.—W. H. Hudleston, F.G.S., President, in the chair.—Messrs. H. Baker, F.C.S., and R. Fleming, were elected Members.—The following paper was read:—On some minerals from the sodalite syenite of Julianshaal District, South Greenland, by Johann Lorengen; communicated by Prof. Johnstrup.—Mr. Baring Gould and Mr. Porter Rhodes, who were present as visitors, gave an account of the diamond mine of Kimberley, South Africa, illustrated by photographs of the workings and by numerous specimens, which gave rise to an interesting conversation.

PARIS

Academy of Sciences, December 19.—M. Wurtz in the chair.—The following papers were read:—Proofs of the recent formation of the Mediterranean, by M. Blanchard. In the nature and relations of plant species in places more or less apart he seeks evidence regarding changes that have occurred in the configuration of the land. Were the banks of the Mediterranean brought together one might pass from Europe into Africa or into Asia without any trait of nature making one aware of it. Now as very moderate obstacles prevent a dissamination of many plants and animals, the Mediterranean would be absolutely uncrossable by most living species. It is inferred that the sea has been formed in the present age of the earth, when the animals and plants on the coasts were under the same conditions as now. The recent study of the marine fauna, proving that there are few species in the depths, and those present are probably from the Atlantic, is thought confirmative. M. Milne Edwards considered the uniformity of natural productions explained rather by the recent existence of two isthmuses between the northern and southern banks of an older sea, one between Sicily and Tunis, the other between Spain and Morocco. The Mediterranean has probably not been in communication with the Indian Ocean since the Miocene epoch. M. Daubrée also declined, on geological grounds, to accept M. Blanchard's conclusion.—Observations on the decomposition of metallic formiates in presence of water, by M. Berthelot.—On the principle of surfaces of separation, by the same.—M. de Lesseps presented maps and plans of the project of a railway between the Niger and the Soudan, by the Fonta-Djallon. The Fonta-Djallon presents a central plateau 350 km. from the coast and 1000 m. in altitude; five parallel valleys run from it to the coast. The iman of Timbo (in that region) is friendly.—Researches on the fundamental laws of electrodynamics, by M. Le Cordier. This mathematical memoir was deposited as a sealed packet in September.—On a means of preventing the development of phylloxera by turfing the ground in the intervals of the vine-stocks, by M. Bidauld. This proposal is based on the facts that heating of the ground is very favourable to hatching of the apterous, and still more of the winged phylloxera, and that according to MM. Becquerel, bare ground requires in summer a much higher temperature than turfed ground.—Ephemerides of the planet (217) Eudore (continued), by M. Callandreau.—On the introduction of logarithms in criteriums, which determine an upper limit of the number of roots of an equation which are comprised between two given numbers, by M. Laguerre.—On a differential equation of the form $f\left(u\frac{du}{dz}\right)=0$, by M. Fuchs.—On functions irreducible according to a prime modulus, by M. Pellet.—Theorem of arithmetic, by M. Weil.—Amplitude of diurnal oscillation of the magnetic declination obtained at the Observatory of the Charles Albert Royal College, at Moncalieri, in the years 1879 and 1880, by M. Denza. In agreement with previous data (1871-78) the minimum occurs in the winter months, and the maximum in summer. The values for the summer months are very variable. The mean annual values for the two years are both superior to that for 1878, which, indeed, is the smallest in the period 1870-1881; the minimum seems to have been passed then, or rather between 1877 and 1878.—On the method of M. Lippmann for determination of the ohm, by M. Brillouin.—History of the process employed for direct coppering of cast iron, by M. Weil. He maintains his rights and priority in the invention. His patents date from 1863.—On the diffusion of solids in solids, by M. Colson. When, *e.g.* in a reducing atmosphere, an iron plate is heated in lampblack, not only does carbon pass into the iron, changing it successively into steel and cast iron, but notable quantities of iron are diffused in the carbon. This will occur at a temperature below red. At a low temperature the iron is more easily diffused in the carbon; at a high, the reverse is the case. Nothing of the kind occurs with platinum. For two solids to diffuse into each other, there must be affinity, or more generally, they must react on each other. M. Colson illustrates this, and he describes an experiment establishing the law of the diffusion.—On the temperature of combustion, and on the dissociation of carbonic acid and of aqueous vapour, by MM. Mallard and Le Chatelier.—On chromocyanide of potassium, by M. Moissan.—On the decomposition of metallic formiates in presence of water; production of some crystalline mineral species, by M. Riban.—On a new sub-class of Infusoria, by Mr. Geddes. This relates to curious, small, curved, pear-shaped cells found in the mesoderm of the Planarian *Convoluta*; they have a large central vacuole, and in the wall of this a row of fibrillæ, which, when the cell is in water, are in rapid rhythmic contraction, altering its shape. When in the animal's body, the cell shows but slight contraction. The author thinks these cells parasitic infusoria, and proposes for them the name *Pulsatella convolutæ*; a fourth sub-class, *Pulsatorians*, being here represented.—On a new type of Turbellaria, by M. Silliman. This was got at Roscoff; it is parasitic on a green parasitic nematoid. It is intermediate between Turbellaria and Trematoda, and the author proposes to call it *Syndesmis*. The genital organs are the most remarkable character.—On the live fishes, crabs, and molluscs ejected by the Artesian wells of the Oued Rir (Sahara of the province of Constantine), by M. Rolland. These animals are only for a time under ground in passing from one "bahr" or pond to another.—On the age of the carboniferous limestone of the Central Oural, by M. Grand Eury.—Two posthumous memoirs of M. Delesse were presented: one on the influence of soil on the composition of the ashes of plants, the other on the waters of Savoy.

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